



## **The Story- and Simulation approach: Scenario development as a method to integrate practical and scientific knowledge for long-term water planning**

Janina Onigkeit, Joseph Alcamo, and Barbara Luebkert-Alcamo

Center for Environmental Systems Research, University of Kassel, Kassel, Germany (onigkeit@usf.uni-kassel.de)

Scenario development, as a widely used planning method, provides the potential for a structured and target-oriented dialogue between scientists and stakeholders. In the GLOWA Jordan River project a scenario process was initiated to facilitate the development of water management strategies to cope with the widening gap between water supplies and demands that are expected due to changing climate conditions, increasing population and changing life styles. We used a procedure called the “SAS approach” (Story and Simulation) to carry out a scenario exercise dealing with the future situation of water and the environment in the Jordan River region up to the year 2050. The SAS approach is a stakeholder-driven and iterative procedure that requires an engagement of both, stakeholders and project scientists in the scenario building process. The aim of using this approach is to integrate regional mostly qualitative knowledge provided by stakeholders from different backgrounds and quantitative information mainly provided by scientific models. As members of a scenario panel and responsible for the development of scenario storylines, stakeholders and other experts from Israeli, Jordanian and Palestinian water-related agencies and ministries as well as representatives of NGOs played an active role in the scenario development process.

The development of water strategies was organized as a two-step procedure: In a first step, the “GLOWA Jordan River scenarios of regional development under climate change” have been developed: As most important factors driving the changes in the future water situation in the region, the members of the scenario panel identified the economic development and the extent to which regional water resources will be shared in the future. Combinations of extreme developments of these two factors served as the basis for a set of four scenario storylines containing narrative as well as quantitative elements.

The four scenarios cover the future development in Israel, Jordan and the Palestinian Authority and can be characterized as follows:

- (1) “Willingness & Ability” – A scenario under which economic growth and multi-lateral water sharing leads to a flourishing region due to lasting peace and world-wide economic growth.
- (2) “Modest Hopes” – A scenario under which despite of unilateral dividing of water economic growth prevails due to heavy regional investments of outside donors to prevent deterioration of the political situation.
- (3) “Suffering of the Weak & the Environment” – A scenario under which economic recession in combination with unilateral dividing of water resources leads to a stagnation or worsening of the regional development.
- (4) “Poverty & Peace” – A scenario under which economic recession prevails, but multi-lateral water sharing reflects an improvement of the political situation.

In the second step these four scenarios were used as a backdrop for the development of strategies for a sustainable management of regional water resources. Covering a wide range of possible and consistent futures the scenarios allow for an elaboration of a diversity of water-related management options. To be relevant for water management in the region, the development of strategies again requires an active participation of regional stakeholders.

The main objective of the presentation is to describe the SAS methodology including examples of the quantitative results and storylines and discuss the SAS approach with respect to its ability to support a dialogue between scientists and stakeholders in the Jordan River region.